Claims

What is claimed is:

1. Method for calculating a position of a mobile communications equipment, by

receiving physical communication channels within the mobile communications equipment,

receiving first signal codes within said physical communication channels,

measuring a signal phase of said first signal code within said mobile communications equipment,

measuring a carrier signal within said physical communications channels within said mobile communications equipment,

reducing a noise level of said measured signal phase by using said carrier signal, and

calculating said position of said mobile communications equipment using at least said noise level reduced signal phase.

2. The method of claim 1, wherein said signal phase is a signal code phase.

3. The method of claim 2, wherein said noise level of said measured signal code phase is reduced by filtering with said carrier signal.

4. The method of claim 1, wherein said carrier signal is obtained from a measured frequency shift.

5. The method of claim 4, wherein said measured frequency shift is a pseudodoppler frequency.

6. The method of claim 1, wherein said carrier signal is obtained from an accumulated carrier phase measurement.

7. The method of claim 3, wherein said filtering is done by carrier smoothing.

8. The method of claim 2, wherein a threshold value for estimating said signal code phase is defined.

9. The method of claim 2, wherein the phase of said first signal code phase is tracked and said carrier signal is obtained from a carrier and/or phase tracking loop.

10. The method of claim 1, wherein said carrier signal is obtained from matched filter outputs within said mobile communications equipment.

11. The method of claim 1, wherein said physical communication channels are transmitted from ground based base stations.

12. The method of claim 1, wherein said signal phase is transmitted from said mobile communications equipment to a base station.

13. The method of claim 1, wherein said measured carrier signal is transmitted from said mobile communications equipment to said base station.

14. The method of claim 1, wherein said position is calculated within an underlying communications network.

15. The method of claim 1, wherein said position is calculated using a time of arrival calculation principle.

16. The method of claim 1, wherein said position is calculated using a time difference of arrival calculation principle.

17. The method of claim 1, wherein at least position information of said base station are transmitted from said base station to said mobile communications equipment.

18. The method of claim 1, wherein said signal code is a pilot signal code.

19. The method of claim 1, wherein said base station and said mobile equipment utilize a code division multiple access communication protocol.

20. The method of claim 1, wherein said position is calculated using a hybrid position calculation.

21. Method for calculating a position of a mobile phone using advanced forward link trilateration, by

receiving physical communication channels within the mobile communications equipment,

receiving first signal codes within physical communication channels,

measuring a pilot signal code phase of said first signal code within said mobile communications equipment,

measuring a frequency shift within said physical communications channels within said mobile communications equipment,

smoothing said pilot signal code phase by using said measured frequency shift, and calculating said position using at least said smoothed pilot signal phase.

22. Mobile communications equipment comprising

reception means for receiving physical communication channels,

a first signal processor for measuring a signal phase of a first signal code within said physical communication channels,

a second signal processor for calculating a carrier signal within said physical communications channels, and

calculation means for calculating a noise level reduced signal phase by using said carrier signal.

23. The mobile communications equipment of claim 22, wherein said calculation means provide reducing noise level of said measured signal code phase by filtering with said carrier signal.

24. The mobile communications equipment of claim 22, wherein said second signal processor provides obtaining the carrier signal from a measured frequency shift.

25. The mobile communications equipment of claim 22, wherein said calculation means provide filtering said signal code phase with said carrier signal by carrier smoothing.

26. The mobile communications equipment of claim 22, wherein said second signal processor provides matched filters for calculating said carrier signal.

27. The mobile communications equipment of claim 22, comprising communication means for transmitting said signal code phase from said mobile communications equipment to a base station.

28. The mobile communications equipment of claim 22, comprising communication means for transmitting said measured carrier signal from said mobile communications equipment to a base station.

29. The mobile communications equipment of claim 22, comprising calculation means for calculating said position using a hybrid position calculation.

30. Mobile communications equipment comprising

reception means for receiving physical communication channels,

a first signal processor for measuring a signal phase of a first signal code within said physical communication channels,

a second signal processor for calculating a pseudodoppler frequency within said physical communications channels,

calculation means for calculating a noise level reduced signal phase by using said pseudodoppler frequency, and

position calculation means for calculating said position using at least said noise level reduced signal phase.

31. System for calculating a position of a mobile communications equipment comprising

at least one ground based base station

providing physical communication channels comprising a first signal code,

at least one mobile communications equipment, wherein said mobile communications equipment comprises

a first signal processor for measuring a signal phase of a first signal code within said physical communication channels,

a second signal processor for calculating a carrier signal within said physical communications channels, and

calculation means for calculating a noise level reduced signal phase by using said carrier signal.

32. Computer program for calculating a position of a

mobile communications equipment, operable to cause a processor to

receive physical communication channels within the mobile communications equipment,

receive first signal codes within said physical communication channels,

measure a signal phase of said first signal code within said mobile communications equipment,

measure a carrier signal frequency within said physical communications channels within said mobile communications equipment, and

reduce a noise level of said measured signal phase by using said carrier signal frequency.

33. A computer program product comprising a computer program of claim 32.

33. Module in communication with reception means of a mobile communication equipment, comprising

a first signal processor for measuring a signal phase of a first signal code within said physical communication channels,

a second signal processor for calculating a carrier signal within said physical communications channels, and

calculation means for calculating a noise level reduced signal phase by using said carrier signal.